

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NEW YORK**

SOTER TECHNOLOGIES, LLC,)	
)	
Plaintiff)	
)	
v.)	No. 2:20-cv-02989-GRB-AKT
)	PUBLIC VERSION
IPVIDEO CORPORATION, A+ TECHNOLOGY)	
& SECURITY SOLUTIONS, INC., HALO)	
SMART SOLUTIONS, INC. & ADVANCE)	
CONVERGENCE GROUP, INC.)	
)	
Defendants)	
)	
)	
IPVIDEO CORPORATION, HALO SMART)	
SOLUTIONS, INC. & ADVANCE)	
CONVERGENCE GROUP, INC.)	
)	
Counterclaim/Third-Party Plaintiffs)	
)	
v.)	
)	
SOTER TECHNOLOGIES, LLC)	
)	
Counterclaim Defendant,)	
)	
and)	
)	
INTELLIGENT PRODUCT SOLUTIONS, INC.)	
and DEREK PETERSON)	
)	
Third-Party Defendants)	
)	

**DEFENDANTS’ RESPONSE IN OPPOSITION TO
PLAINTIFF’S OPENING *MARKMAN* BRIEF**

Defendants IPVideo Corporation, A+ Technology & Security Solutions, Inc., Halo Smart Solutions, Inc., & Advance Convergence Group, Inc. (collectively, “IPVideo”) hereby submit this Response in Opposition to Plaintiff Soter Technologies, Inc.’s (“Soter”) Opening *Markman* Brief (“Soter Br.”) regarding U.S. Patent No. 10,699,549 (“the ’549 Patent”).

TABLE OF CONTENTS

Table of Authorities	ii
I. Relevant Background.....	2
II. Legal Standards.....	5
III. Disputed Terms for Construction.....	7
A. “Abnormality Matching Signature”	7
B. “Abnormality Matching Signature of Vaping”.....	9
C. “A Signature”	15
D. “Air Quality” & “Air Quality Sensor”	17
E. “Abnormality Matching Signature Includes . . .” or “Signature Includes . . .”.....	19
F. “Identifying Vaping” & “Vaping Is Identified”	20
G. “Sound Detector” & “Detected Sounds”	20

TABLE OF AUTHORITIES

<i>3M Innovative Properties Co. v. Avery Dennison Corp.</i> , 350 F.3d 1365 (Fed. Cir. 2004).....	10
<i>ACTV, Inc. v. Walt Disney Co.</i> , 346 F.3d 1082 (Fed. Cir. 2003).....	8
<i>Andersen Corp. v. Fiber Composites, LLC</i> , 474 F.3d 1361 (Fed. Cir. 2007).....	16
<i>AquaTex Indus., Inc. v. Techniche Solutions</i> , 419 F.3d 1374 (Fed. Cir. 2005).....	17
<i>Astrazeneca AB v. Mutual Pharm. Co.</i> , 384 F.3d 1333 (Fed. Cir. 2004).....	10, 11
<i>CCS Fitness, Inc. v. Brunswick Corp.</i> , 288 F.3d 1359 (Fed. Cir. 2002).....	7, 10
<i>Comark Commc'ns v. Harris Corp.</i> , 156 F.3d 1182 (Fed. Cir. 1998).....	6
<i>Curtiss-Wright Flow Control Corp. v. Z&J Techs. GmbH</i> , 563 F. Supp. 2d 1109 (C.D. Cal. 2007)	12
<i>Edwards Lifesciences LLC v. Cook Inc.</i> , 582 F.3d 1322 (Fed. Cir. 2009).....	13
<i>Fantasy Sports Properties, Inc. v. Sportsline.com, Inc.</i> , 287 F.3d 1108 (Fed. Cir. 2002).....	12
<i>Gen. Am. Trans. Corp. v. Cryo-Trans, Inc.</i> , 93 F.3d 766 (Fed. Cir. 1996).....	14
<i>GPNE Corp. v. Apple Inc.</i> , 830 F.3d 1365 (Fed. Cir. 2016).....	11
<i>Hockerson-Halberstadt, Inc. v. Converse Inc.</i> , 183 F.3d 1369 (Fed. Cir. 1999).....	8
<i>Immunex Corp. v. Sanofi-Aventis U.S. LLC</i> , 977 F.3d 1212 (Fed. Cir. 2020).....	9
<i>Kraft Foods, Inc. v. Int'l Trading Co.</i> , 203 F.3d 1362 (Fed. Cir. 2000).....	13

<i>Kyocera Wireless Corp. v. Int’l trade Com’n</i> , 545 F.3d 1340, 1347 (Fed. Cir. 2008).....	8
<i>Macrovision Corp. v. Dwight Cavendish Devs. Ltd.</i> , 105 F. Supp. 2d 1070 (N.D. Cal. 2000)	12
<i>MagSil Corp. v. Hitachi Global Storage Techs., Inc.</i> , 687 F.3d 1377 (Fed. Cir. 2012).....	14
<i>Markman v. Westview Instruments, Inc.</i> , 52 F.3d 967 (Fed. Cir. 1995).....	6
<i>Medrad, Inc. v. MRI Devices Corp.</i> , 401 F.3d 1313 (Fed. Cir.2005).....	6
<i>Multiform Desiccants, Inc. v. Medzam, Ltd.</i> , 133 F.3d 1473 (Fed. Cir. 1998).....	16, 17
<i>Nystrom v. TREX Co. Inc.</i> , 424 F.3d 1136 (Fed. Cir. 2005).....	16, 17
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005).....	passim
<i>Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.</i> , 711 F.3d 1348 (Fed. Cir. 2013).....	7
<i>SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.</i> , 242 F.3d 1337 (Fed. Cir. 2001).....	13
<i>Summit 6, LLC v. Samsung Elecs. Co.</i> , 802 F.3d 1283 (Fed. Cir. 2015).....	7, 20
<i>Tandon Corp. v. U.S. Int’l Trade Comm.</i> , 831 F.2d 1017 (Fed. Cir. 1987).....	12
<i>Teva Pharma. USA, Inc. v. Sandoz, Inc.</i> , 574 U.S. 318 (2015).....	6
<i>Thorner v. Sony Comp. Enter. Am. LLC</i> , 669 F.3d 1362 (Fed. Cir. 2012).....	7
<i>Toro Co. v. White Consol. Indus.</i> , 199 F.3d 1295 (Fed. Cir. 1999).....	14
<i>Toshiba Corp. v. Imation Corp.</i> , 681 F.3d 1358 (Fed. Cir. 2012).....	20

<i>Vederi LLC v. Google, Inc.</i> , 744 F.3d 1376 (Fed. Cir. 2014).....	6
<i>Wang Labs., Inc. v. Am. Online, Inc.</i> , 197 F.3d 1377 (Fed. Cir. 1999).....	13, 14
<i>Wyeth v. Teva Pharma. USA, Inc.</i> , No. 3-CV-1293, 2005 WL 2175440 (D.N.J. Sept. 6, 2005)	11

IPVideo’s constructions are well grounded in the all-important intrinsic record of Soter’s ’549 Patent: its claims, specification, and prosecution history. Moreover, they conform to the inventors’ testimony that at the time of filing their patent application, they had only discovered, and only disclosed in their patent specification, how to detect vaping using a *gas sensor* that relied on a combination of hydrogen, humidity, and temperature measurements. Their testimony also confirms that they lacked knowledge of how to use a *particle sensor* to detect vaping until 2019, long after the ’549 Patent’s priority filing under the Patent Cooperation Treaty (“PCT”).

IPVideo’s showing thus unmasks Soter’s proposed constructions as motivated *not* by the proper tenets of claim construction, but by the litigation goal of contorting the ’549 patent claims to read on IPVideo’s accused Halo device. For example, Soter repeatedly argues that IPVideo improperly seeks to limit certain constructions to a preferred embodiment. This argument fails, however, because the ’549 Patent specification makes clear that it is only directed to a single embodiment that uses a *gas sensor* to measure hydrogen levels, in combination with temperature and humidity values, to identify the presence of vaping—for which the inventors created a special defined term used in the claims (“abnormality matching signature of vaping”). This limited disclosure properly informs the scope of the claims and is consistent with the inventor testimony of what was known (and not known) at the time of the purported invention (late-2018).

For context, IPVideo’s accused Halo device—conceived of and reduced to practice *before* Soter filed the PCT application that led to the ’549 Patent—utilizes a *particle sensor* to detect certain particulates in the air associated with vaping. It does not use hydrogen, temperature, or humidity as required by the ’549 Patent. Soter’s contrived constructions, necessary to support its baseless infringement allegations, fail to square with either the intrinsic record, or any of the extrinsic evidence. Soter instead seeks to expand the claims well-beyond

what was disclosed in the '549 Patent specification and what was known to a person of ordinary skill in the art ("POSA") at the time of invention, *including the inventors themselves*.

I. RELEVANT BACKGROUND

The '549 Patent is directed to an early iteration of Soter's commercial "FlySense" device—a vape detector marketed primarily to schools for use in bathrooms and other areas not susceptible to video and other surveillance. '549 Patent, col. 1:26-39. The first generation of the FlySense device was principally developed by inventor William Schweigert, then an undergraduate engineering student at Stony Brook University. Soter Br. Ex. L, Schweigert Dec. ¶4. At Stony Brook, Schweigert participated in a "hack-a-thon" engineering competition in which he sought to develop a "smart" Internet-of-Things ("IOT") smoke detector. *Id.* ¶4. Following the event, Soter's CEO Derek Peterson—Schweigert's neighbor and one of the hack-a-thon judges—approached Schweigert about developing a similar device to detect vaping. *Id.*

The first FlySense device employed the same off-the-shelf "MQ-2" gas sensor Schweigert used during the hack-a-thon—an "indiscriminate" gas sensor used to identify the presence of a large number of gases in the air, including liquefied petroleum gas, smoke, alcohol, propane, hydrogen, methane, and carbon monoxide. *Id.* ¶8; Ex. A, Schweigert Tr. at 28:17–31:1; 48:18-21.) If the MQ-2 gas sensor detected any one or more of these gases, the sensor emitted a signal—though it did not indicate what particular gas was detected. Schweigert Dec. ¶9. After initial testing, Soter determined that this first generation FlySense device employing the MQ-2 gas sensor could be used to identify vaping. Schweigert Dec. ¶¶12-14. Soter's original provisional patent application filed Aug. 15, 2017, cited (and incorporated by reference) in the '549 Patent, describes this first-generation device, indicating simply that the "gas sensor" outputs a voltage relative to the concentration of the measured gases in the air. *Id.* ¶14. While the first-generation FlySense could technically detect vaping, it was prone to many "false positives"

triggered by, *e.g.*, air fresheners and cleaning agents that limited its practical use and marketability. Soter Br. Ex. J, Hussain Dec. ¶¶3-4; Schweigert Tr. 48:15-17; 121:13-16. Soter determined that experimentation with other sensors was warranted. Schweigert Dec. ¶15.

To that end, in May 2018 Soter identified the SGAS 701 sensor—a hydrogen gas sensor that, in combination with temperature and humidity measurements, could be used to detect vape with fewer false positives than its first-generation device. Hussain Dec. ¶¶13-14; Soter Br. Ex. K, Elbadry Dec. ¶8; Ex. B, Hussain Tr. at 110. After developing algorithms specific to this sensor, Soter concluded that “a modified hydrogen sensor in combination with temperature and humidity sensors was the best choice at the time.” Elbadry Dec. ¶8. That “time” was spring/summer 2018, when the “FS265” FlySense model was memorialized in the PCT application filed Aug. 15, 2018 that later issued as the ’549 Patent. Elbadry Tr. at 148:21-149:2 (confirming no sensors other than temperature, hydrogen and humidity disclosed in ’549 Patent); Hussain Tr. at 186:6-8 (same). Indeed, the ’549 Patent specification defines the term “signature” to mean a “specific range combination of humidity, hydrogen, and temperature.” col. 9:21-23; col. 5:4-6 (“vaping may be identified based on *the* signature”).

Critically, the inventors confirmed that in the Spring/Summer of 2018, they understood using a particle sensor or particle detector to detect vaping would have been impractical for Soter’s purposes, as such sensors were “too large for our application requirements and very expensive.” Hussain Dec. ¶15; Hussain Tr. at 116:24 – 117:2 (“[REDACTED]”). Accordingly, in August 2018, when the ’549 Patent’s parent PCT application was filed, a particle sensor like the one used in the accused Halo product was not considered. *Id.*; Ex. C, Elbadry Tr. at 130:5-10 (“Q. [REDACTED]

[REDACTED]). Soter had not identified a particle sensor, had not experimented with a particle sensor, and of course had not even considered, let alone developed the unique and complex algorithms that would be necessary to identify vaping using a particle sensor. And notably, there is neither mention of a particle sensor (or any other sensors besides hydrogen, temperature, and humidity sensors) anywhere in the '549 Patent or its prosecution history, nor any enabling disclosure teaching how one might use a particle sensor to detect vaping. *See, e.g., id.* at 144:17-22 (confirming absence of particle detectors in '549 Patent disclosure); *see also* Schweigert Tr., 103:17-107:2 (confirming absence of such disclosure in original provisional application as well).

It was not until the Spring of **2019** that Soter had its “eureka” moment regarding particle sensors. Hussain Tr. at 125:9–126:4 (“Q: [REDACTED] [REDACTED] ? A: [REDACTED] [REDACTED]”). This is best evidenced by the “Winner winner chicken dinner” email sent by inventor Asheik Hussain in April 2019, wherein he first told others at Soter about his evaluation of the “SPS30” particle sensor that was giving “amazing results.” Hussain Tr. at 147:21-48:6 (discussing Elbadry Ex. 3); Elbadry Ex. 2 at 2873 (Feb. 2019 email first identifying “new” particle sensor from sensiron). In that email, he detailed how his testing demonstrated that this new, previously untested and previously impractical particle sensor was able to differentiate between vape particulates and particulates associated with cleaning materials and air fresheners that gave previous iterations of the FlySense false positives. *Id.* This sensor was ultimately incorporated into the FlySense device. Hussain Dec. ¶¶16-17; Hussain Tr. at 151:18-20.

Once again, nothing in the '549 Patent or its prosecution history discloses use of a particle sensor to detect vape, which is not surprising given that the necessary sensor, algorithms

and other mechanics of detecting vape using a particle sensor (rather than the gas or chemical sensors used previously) were not discovered by Soter until at least *Spring 2019*, months *after* Soter filed the application that led to the '549 Patent (and even longer after IPVideo filed its patent application disclosing vape detection with a particle sensor). See Ex. D, IPVideo U.S. Prov. App. 62/691,959 at 1-5 (filed June 29, 2018). And given the experimentation and testing necessary to implement Soter's chosen particle sensor, it becomes obvious that the relevant POSA reading the '549 Patent would, without knowledge of Hussain's "amazing results," also lack the knowledge to use a particle sensor to detect vape at the time of its August 2018 PCT filing. Elbadry Tr. at 124:4-8 ("[REDACTED]"); Hussain Tr. at 188:14-15 ("[REDACTED]").

Soter's late discovery of a particle sensor is further supported by Soter's other U.S. Patent No. 10,777,063 ("the '063 Patent"). The application leading to the '063 Patent was not filed until March 9, 2020 and for the first time discloses "vaping may be identified based on *signature*, which includes a temperature range, a humidity range, a hydrogen range, a total volatile organic compound range, *a particulate concentration range, and a particulate mass range.*"¹ Ex. E, '063 Patent, col. 4:8-14. The '063 Patent's single inventor, Cary Chu, was not an inventor on the '549 Patent, further establishing that use of *particle sensors* to measure a "particulate concentration range" or a "particulate mass range" was *not* contemplated by the '549 Patent.

II. LEGAL STANDARDS

Claim construction should be driven by an objective understanding of the meaning of the disputed claim terms based first on the intrinsic evidence and then only if needed, on any relevant extrinsic evidence. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed.

Cir. 1995); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (“while extrinsic evidence ‘can shed useful light on the relevant art,’ we have explained that it is ‘less significant than the intrinsic record in determining the legally operative meaning of claim language.’”).

It is “a ‘bedrock principle’ of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips*, 415 F.3d at 1312. The construction of a claim term is “exclusively for the court to determine.” *Teva Pharma. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 321 (2015). Claims should generally be given “their ordinary and customary meaning[,]” which “is the meaning that the term would have to a person of ordinary skill in the art in question ***at the time of the invention.***” *Phillips*, 415 F.3d at 1312-13.

Ascertaining a term’s meaning begins with the intrinsic record, which consists of the claims, the patent specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *see also Vederi LLC v. Google, Inc.*, 744 F.3d 1376, 1382 (Fed. Cir. 2014). With respect to the intrinsic record, “the claims themselves provide substantial guidance as to the meaning of particular claim terms.” *Phillips*, 415 F.3d at 1314; *accord Comark Commc’ns v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998) (“The appropriate starting point . . . is always with the language of the asserted claim itself.”). The context in which a disputed term is used in the asserted claims may provide substantial guidance as to its meaning. *See Phillips*, 415 F.3d at 1314. That said, the relevant POSA reads the claims in the context of the entire patent. *Id.* (quoting *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir.2005) (“We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description [or specification] and the prosecution history.”)).

A fundamental claim construction principle applicable here is that where the specification reveals a patentee’s special definition for a claim term, “the inventor’s lexicography governs.”

¹ All emphasis is added unless otherwise indicated.

Id. at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (“claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and **clearly set forth a definition** of the disputed claim term in either the specification or prosecution history”)). This is true even if the plain and ordinary meaning of a term is broader. *See Thorner v. Sony Comp. Enter. Am. LLC*, 669 F.3d 1362, 1365-67 (Fed. Cir. 2012).

Only where the intrinsic record is ambiguous may the Court “rely on extrinsic evidence, which ‘consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treaties.’” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1360 (Fed. Cir. 2013) (citations omitted). “Extrinsic evidence may not be used ‘to contradict claim meaning that is unambiguous in light of the intrinsic evidence.’” *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1290 (Fed. Cir. 2015). Here, extrinsic evidence is largely unnecessary given the clear definitions set forth in the ’549 Patent specification (*e.g.*, the unambiguous definition of “signature”), other than the inventor testimony confirming that there was no other embodiment known to the inventors at the time of the invention other than use of hydrogen, temperature, and humidity, and that use of a particle sensor was believed to be impractical and thus not within the scope of the claimed invention. *See Phillips*, 415 F.3d at 1318 (holding that inventor testimony should only be considered where it is not “clearly at odds with the . . . written record of the patent”).

III. DISPUTED TERMS FOR CONSTRUCTION

A. “Abnormality Matching Signature” (claims 1, 13, 25).

Soter’s Construction	IPVideo’s Construction
“one or more parameters, such as a window size, threshold values or ranges, from a sensor indicating the presence of conduct to be detected, such as vaping, smoking and bullying”	“abnormality matching signature” standing alone is not in the claims of the ’549 Patent and therefore construction of this term is improper.

Soter improperly requests construction of this term in isolation, but construction is

unnecessary and improper because this term in isolation is not present in the '549 Patent claims. Rather, “abnormality matching signature” is only used in the claims with the additional modifier “of vaping,” making only construction of the full phrase “abnormality matching signature of vaping” (discussed *infra*) proper before the Court. *See Kyocera Wireless Corp. v. Int’l trade Com’n*, 545 F.3d 1340, 1347 (Fed. Cir. 2008) (“the court does not interpret claim terms in a vacuum, devoid of the context of the claim as a whole”). “Abnormality matching signature” only appears without the “of vaping” modifier where “abnormality matching signature of vaping” provides an antecedent basis for the phrase that includes “of vaping.” *E.g.*, claim 1; *see also* Soter Ex. I, Brown Dec. ¶¶28-30. Construction of the broader term “abnormality matching signature” is therefore improper. *See Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) (“proper claim construction . . . demands interpretation of the entire claim in context, not a single element in isolation.”); *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003) (“While certain terms may be at the center of the claim construction debate, the context of the surrounding words of the claim also must be considered....”).

Moreover, even if construction of the term were proper, Soter’s proposed construction is impermissibly broad. Nothing in the '549 Patent’s *claims* indicates that “smoking” or “bullying” is detected using an “abnormality matching signature.” *See, e.g.*, claim 6 (identifying bullying “based on the detected sounds”); *id.* (“a controller configured to identify vaping”); claim 18 (same); claim 20 (“generate base data for detecting the potential bullying”); claim 25 (“A sensor system for identifying vaping at a site”). While the originally filed '549 Patent claims included the phrase “a network interface configured to transmit a signal indicating abnormality matching signature of vaping, other smoking activity, or sound of bullying,” (Soter Br. at 9), that language was removed during prosecution and the claims were narrowed to include only “a signal

indicating abnormality matching signature *of vaping*,” not a signal indicating other smoking activity or a signal indicating the sound of bullying. *See* April 13, 2020 Response to Office Action (Soter Ex. U at 2907-14). Soter’s brief even concedes as much: “While the invention described is directed to a system for detecting vaping, smoking and bullying, the claims that issued are directed to a system that identifies vaping based on an abnormality matching signature of vaping.” Soter Br. at 3. Accordingly, construction of this non-existent term is unnecessary, and Soter’s proposed construction that seeks to impermissibly broaden the meaning of the term should be rejected.² *Immunex Corp. v. Sanofi-Aventis U.S. LLC*, 977 F.3d 1212, 1218 (Fed. Cir. 2020) (“We begin claim construction by looking to the language of the claim itself.”).

B. “Abnormality Matching Signature of Vaping” (claims 1, 13, 25).

Soter’s Construction	IPVideo’s Construction
“one or more parameters, such as threshold values or ranges, from an air quality sensor indicating the presence of vaping.”	“detectable values of the properties and/or contents of air that include temperature, hydrogen, and humidity values that taken together indicate the presence of vaping”

IPVideo’s proposed construction is based on the ’549 Patent’s express definition for “signature” for detecting vaping, as recited in the patent specification. Significantly, as a threshold matter, the relevant POSA would have no understanding of the phrase “abnormality matching signature of vaping” in isolation absent the disclosure in the ’549 Patent specification.³ *See* Brown Dec. ¶¶36-39, 45. “Abnormality matching signature of vaping” is simply not a term of art, has no dictionary or treatise definition, and is wholly absent from the prior art. *Id.* ¶37 (“The abnormality matching signature of vaping is not, for example, the well-known and documented spectral patters of elements (*e.g.*, Sharony Dec. ¶¶54, 58) or published IEEE standard (*id.* ¶59)” as cited by Soter’s expert).

² To the extent that the Court decides that the term “abnormality matching signature” alone should be construed, IPVideo incorporates by reference its proposed construction for “abnormality matching signature of vaping” and associated discussion from Section III.B.

Thus, in construing the term, precedent is clear that claim terms must be read in the context of the entire specification, especially where the patentee specifically defined terms at issue. *See Phillips*, 415 F.3d at 1316 (“the inventor’s lexicography governs”). Here, the inventors unequivocally stated: “Vaping may be detected by specific range combination of humidity, hydrogen, and temperature, **which is defined as signature in this disclosure.**” Col. 9:21-23. Because a POSA would look to the specification to understand the meaning of “abnormality matching signature of vaping,” construction principles demand that the inventors’ definition be incorporated into the term. *See Phillips*, 415 F.3d at 1316; *CCS Fitness*, 288 F.3d at 1366.

Soter argues that this construction would improperly limit the claim to a preferred embodiment. Soter Br. at 14-15. Not so. Importantly, the inventors did not indicate that this definition for “signature” was merely exemplary or a preferred embodiment, but went further to specifically “define” the term to these specific elements throughout “this disclosure” (*i.e.*, the entire ’549 Patent), thereby cabining the scope of the term. *See, e.g., 3M Innovative Properties Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1369, 1371 (Fed. Cir. 2004) (holding that patentee acted as own lexicographer when the specification specifically stated what the claim term at issue “means”—“Multiple embossed’ **means** two or more embossing patterns are superimposed...”); *Astrazeneca AB v. Mutual Pharm. Co.*, 384 F.3d 1333, 1339-40 (Fed. Cir. 2004) (holding that specification’s statement that the suitable solubilizers are “defined below” limited the term “solubilizer” to those defined in the specification).

The *Astrazeneca* case is instructive. There, after stating that the suitable solubilizers “**are defined below,**” the specification proceeds two paragraphs later to state that “[t]he solubilizers suitable for the preparations according to the invention are semi-solid or liquid non-ionic **surface active agents.**” 384 F.3d at 1339. The Court rejected the patentee’s argument that the statements

³ The same is true of “abnormality matching signature.”

merely identified preferred embodiments and held that a claim term may be limited even without the “rigid formalism” of “I define ____ to mean ____,”—the actual formalism used by Soter in the ’549 Patent specification (“which is *defined* as signature in this disclosure” (col. 9:21-23)). *Id.* The Federal Circuit explained that it was not a case where the specification indicated that “a solubilizer” might include the “surface active agents” identified, but instead the specification specifically identified “*the* solubilizers suitable . . . ,” *id.*, just as the ’549 Patent does here. *See, e.g.,* col. 9:21-23 (“defined”); col. 5:3-13 (“Since vaping has a signature in temperature, humidity, and hydrogen ranges, vaping may be identified based on *the* signature.”).

IPVideo’s proposed constructions are further supported because all embodiments in the specification conform to the inventors’ definition. *See id.* at 1340 (“preferred embodiments can shed light on the intended scope of the claims”); *Wyeth v. Teva Pharma. USA, Inc.*, No. 3-CV-1293, 2005 WL 2175440, at *5 (D.N.J. Sept. 6, 2005) (limiting “extended release formulation” to a limited set of ingredients where specification stated, and all embodiments presented, were limited to the certain ingredients identified). That too, is the case here, where there is but one embodiment presented: a signature based on hydrogen, humidity, and temperature. *Id.*; *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir. 2016) (“when a patent ‘repeatedly and consistently’ characterizes a claim term in a particular way, it is proper to construe the claim term in accordance with that characterization”).

Soter next argues that the doctrine of claim differentiation saves it from IPVideo’s proper claim construction. Soter Br. at 14. This fallback argument falls short. First, claim differentiation only applies if the absence of different meanings of claim terms would render one claim superfluous. *See Curtiss-Wright Flow Control Corp. v. Z&J Techs. GmbH*, 563 F. Supp. 2d 1109, 1119 (C.D. Cal. 2007) (“claim differentiation comes into play when a claim construction

would render additional, or different, language in another independent claim superfluous”); *Macrovision Corp. v. Dwight Cavendish Devs. Ltd.*, 105 F. Supp. 2d 1070, 1074 (N.D. Cal. 2000) (citing *Tandon Corp. v. U.S. Int’l Trade Comm.*, 831 F.2d 1017, 1023 (Fed. Cir. 1987)).

Soter’s brief incorrectly states that IPVideo’s proposed construction improperly imports limitations of, *e.g.*, claim 2, “which specifically requires the abnormality matching signature of vaping to include temperature, hydrogen and humidity,” into the independent claims. Soter Br. at 14. But Soter misquotes the limitations of claims 2, 14, and 26, which actually call for “a temperature *range*, a humidity *range*, and a hydrogen *range*,” elements distinguishable from the proper construction calling for “detectable *values*” of temperature, hydrogen and humidity that correspond to the “specific range combination” required by the specification. (Col. 9:21-23.) Accordingly, because different limitations are involved, claim differentiation does not apply. *See Tandon*, 831 F.2d at 1023-24 (“one can not interpret a claim to be broader than what is contained in the specification and claims as filed”).⁴

Second, even if the doctrine did apply, it provides “only a presumption” that each claim has different scope and to be sure, is “not a hard and fast rule of construction” and cannot be relied upon to “broaden claims beyond their correct scope.” *Fantasy Sports Properties, Inc. v. Sportsline.com, Inc.*, 287 F.3d 1108, 1115-16 (Fed. Cir. 2002) (rejecting claim differentiation presumption despite limitations separately identified in dependent claims where patentee had disclaimed subject matter in prosecution history); *Kraft Foods, Inc. v. Int’l Trading Co.*, 203 F.3d 1362, 1368 (Fed. Cir. 2000) (finding that plain language of written description overcame any presumption from claim differentiation).

⁴ Alternatively, if “detectable values” is not the proper construction, then “abnormality matching signature” should be construed to require “a specific range combination of humidity, hydrogen, and temperature,” which is broader and distinguishable from the “temperature range, hydrogen range, and humidity range” of claims 2, 14, and 26, making claim differentiation inapplicable.

Such was the case in *Edwards Lifesciences LLC v. Cook Inc.*, where the claim term “graft” was limited to “intraluminal grafts,” despite dependent claims adding intraluminal limitations. 582 F.3d 1322, 1329-30 (Fed. Cir. 2009). There, any presumption from claim differentiation was overcome because the specification consistently used the words “graft” and “intraluminal graft” interchangeably, and only disclosed intraluminal graft embodiments. *Id.* at 1329 (quoting *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341 (Fed. Cir. 2001) (“Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.”)). Where a construction is demanded by the specification, as here, claim terms should not be given their broadest possible meaning, but should be construed consistent with the specification. *Id.* at 1330 (“Even if the claim construction had rendered the dependent claim redundant, the doctrine of claim differentiation does not require us to give the “graft” devices their broadest possible meaning. We may instead limit “grafts” to “intraluminal” devices, ***as demanded by the specification.***”).

Lastly, Soter disregards the long-settled doctrine that patent claims should not be construed to cover embodiments that are not supported by the specification. *See Wang Labs., Inc. v. Am. Online, Inc.*, 197 F.3d 1377, 1383 (Fed. Cir. 1999) (“Although Wang is correct that a claim is not invalid simply because it embraces subject matter that is not specifically illustrated, in order to be covered by the claims that subject matter must be sufficiently described as the applicant's invention to meet the requirements of section 112.”). The scope of the claims “must be less than or equal to the scope of the enablement to ensure that the public knowledge is enriched by the patent specification.” *MagSil Corp. v. Hitachi Global Storage Techs., Inc.*, 687

F.3d 1377, 1381 (Fed. Cir. 2012) (“the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”). Where, as here, only one embodiment is disclosed and there is no enabling disclosure regarding, for example, how a POSA could identify vaping using anything other than temperature, humidity, and hydrogen, the claims must be construed to require those elements. *See Wang*, 197 F.3d at 1383 (limiting scope of claims to the “only embodiment described” in the specification); *Gen. Am. Trans. Corp. v. Cryo-Trans, Inc.*, 93 F.3d 766, 770 (Fed. Cir. 1996) (noting that the teaching in the specification was “not just the preferred embodiment of the invention; it is the only one described”); *Toro Co. v. White Consol. Indus.*, 199 F.3d 1295, 1300–01 (Fed. Cir. 1999) (construing claim to require a particular configuration where specification described the effectiveness of the configuration and did not disclose others).

Wang is particularly instructive because the inventors testified that they had been unable to develop a decoder using a bit-mapped protocol, leading the Court to find that a bit-mapped protocol was properly excluded from the scope of the “different protocols” claimed. 197 F.3d at 1383. Similarly, here, the inventors testified that a particle sensor was not disclosed in the ’549 Patent and that they understood at the time it to be too large and too expensive for their purposes. Hussain Dec. ¶15; Hussain Tr. at 116:24–117:2 ([REDACTED]

[REDACTED]”). As there is no disclosure other than use of temperature, humidity, and hydrogen to identify vaping, “abnormality matching signature of vaping” should be construed accordingly. *See Elbadry Tr.* at 147:6–16 (“A: [REDACTED]

[REDACTED]

[REDACTED]:

[REDACTED].⁵

Regarding Soter’s proposed construction, it is based on a meaning of “signature” untethered to the inventors’ definition set forth in the ‘549 Patent specification and is therefore untenable. Primarily, it is not supported by the intrinsic evidence for the reasons discussed above. Further, as the inventors confirmed, the values measured vary depending on what sensors are being utilized. *E.g.*, Elbadry Tr. at 124:4-8 (“[REDACTED]”). Accordingly, the Court should reject Soter’s arguments that center on “signature,” Soter Br. at 9-11, as they are irrelevant to the proper construction of the term “abnormality matching signature of vaping.” *See, e.g., Phillips*, 415 F.3d at 1314 (holding that “steel baffles” implies that the term “baffles” does not inherently mean objects made of steel, and therefore the term “baffles” in the claim is narrower than the term “baffles” standing alone).

Soter’s citations to IPVideo’s Halo documentation to support its proposed construction are similarly unavailing. Soter Br. at 10. None of the cited references refers to an “abnormality matching signature of vaping” and all are proprietary documents that are not intended to teach a POSA how to practice Soter’s purported invention, a standard the ‘549 Patent is legally required to meet. 35 U.S.C. §112. More interestingly, Soter cites IPVideo’s documents that teach detection of “VAPE and/or THC based on the presence of chemical signatures *and particulates* in the air.” Soter Br. at 10 (citing SOTER 1468). As such disclosure is conspicuously absent from the ‘549 Patent specification, it cannot support the broad construction that Soter seeks.

C. “A Signature” (claim 25).

Soter’s Construction	IPVideo’s Construction
“a set of one or more parameters that provides an abnormality	“detectable values of the properties and/or contents of air that include temperature, hydrogen, and humidity values

⁵ Soter’s reliance on *Comark*, 156 F.3d at 1187, and *Aria Diags., Inc. v. Sequenom, Inc.*, 726 F.3d 1296, 1301 (Fed. Cir. 2013), (Soter Br. at 14), is misplaced, as neither case involved a clear definition in the specification as we have with the ‘549 Patent’s definition of “signature” here.

matching signature of vaping”	that taken together indicate the presence of vaping”
-------------------------------	--

Claim 25’s use of “signature” in combination with the term “abnormality matching signature of vaping” further substantiates IPVideo’s proposed constructions and requires the terms be construed the same. “Claims that are written in different words may ultimately cover substantially the same subject matter.” *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1370 (Fed. Cir. 2007) (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998)). Indeed, where the specification makes clear that different terms are directed to the same scope, the terms must be construed accordingly. *See Nystrom v. TREX Co. Inc.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005) (“Different terms or phrases in separate claims may be construed to cover the same subject matter where the written description and prosecution history indicate that such a reading of the terms or phrases is proper.”).

In *Nystrom*, for example, claim 1 is directed to “a board” that was construed as being limited to a “wooden board” despite claim 16 being directed to “a wood decking board.” *Id.* Notwithstanding the use of different terms, the Court determined that “board” must be limited to “wood cut from a log” because the written description and prosecution history “frame[d] the invention in the context of wood decking materials cut from logs, even though it acknowledges that other materials exist.” *Id.* Here, the specification and prosecution history make even more clear that “abnormality matching signature of vaping” and “signature” each require detected values of temperature, humidity, and hydrogen; the latter to identify vaping and the former to generate the signal indicating vaping, as the specification does not even acknowledge another signature might exist. *See, e.g.*, col. 9:21-23 (“defined as signature in this disclosure”); Elbadry Tr. at 147:6-16 (“Q: [REDACTED]”). Indeed, because a POSA has no knowledge of a “signature of vaping” apart from the specification, “signature” standing alone is meaningless without the “abnormality matching” modifiers.

Nystrom, 197 F.3d at 1143 (finding “board” and “wood decking board,” like “signature” and “abnormality matching signature” here, were used interchangeably); *AquaTex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1380 (Fed. Cir. 2005) (“the specification ‘makes clear that the patentee did not intend the term [fiberfill] to encompass’ natural materials.”).

Soter’s claim differentiation argument that IPVideo’s proposed construction fails to account for the limitations of claim 26 fails as well. As discussed above, claim 26 states that “the signature includes a temperature *range*, a hydrogen *range*, and a humidity *range*.” IPVideo’s proposed construction calls for temperature, hydrogen, and humidity “*values*” that correspond to the specific range combination required by the specification, and is therefore distinguishable, rendering the principle of claim differentiation inapplicable.⁶ *Multiform Desiccants*, 133 F.3d at 1480 (“[T]he doctrine of claim differentiation can not broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence [C]laims that are written in different words may ultimately cover substantially the same subject matter.”).

D. “Air Quality” & “Air Quality Sensor” (claims 1, 13, 25).

Soter’s Construction	IPVideo’s Construction
“one or more parameters relating to the content or condition of the air that is present at a site”	“measures of certain properties or contents of air”
“a sensor capable of sensing or detecting one or more parameters of air quality that is present at a site”	“a sensor for measuring the certain properties and/or contents of air”

While the parties disagree on the construction of these terms, they do not disagree that however the terms are construed, those constructions must be consistent with the results from identifying an “abnormality matching signature” associated with vaping. *See, e.g.*, Claim 1. As discussed above, the intrinsic evidence establishes that the claim terms must embrace detecting hydrogen, temperature and humidity, the only measures that the intrinsic evidence reveals as

⁶ *See also supra* note 5.

related to identifying vaping. *See Phillips*, 415 F.3d at 1314. On the plain language, hydrogen is a chemical constituent of air, and thus a “content.” Humidity and temperatures are properties of air that can be measured. Hence, IPVideo’s proposed constructions are consistent with the plain and ordinary meaning of the terms used in the claims. Moreover, they are consistent with the specification. *See, e.g.*, ’549 Patent, col. 9:15-22 (“The air quality sensor 220 may detect air quality including moisture and hydrogen **content** in the air and temperature of the air. In other words, the air quality sensor 220 may include a combination of sensors sensing air quality. In an aspect, the air quality sensor 220 may include other sensors sensing **air content** of the environment. Vaping may be detected by specific range combination of humidity, hydrogen, and temperature, which is defined as signature in this disclosure.”).

The Court should reject Soter’s proposed constructions that rely on “one” parameter and the term “parameters,” and seek to measure a “condition” of the air. Soter Br. at 6-8 (citing only extrinsic evidence in support). Again, the Court should look first to intrinsic evidence to determine the meaning of a term. *See Phillips*, 415 F.3d at 1314. Because the ’549 Patent never uses the terms “parameter” in this context, let alone a single parameter, nor the term “condition,” to describe air quality, use of those terms is inappropriate. *Id.* Indeed, the ’549 patent refers to “parameters” only in terms of various operational parameters of a device, not air quality. *E.g.*, col. 6:60-64 (“Internal parameters of the detection sensor 110 may include LED functionality, sound threshold, networking server IP address, alert timeout, serial number, reboot for device required or not, latest binary code, vape identification algorithm parameters.”); Brown Dec. ¶23. Soter’s proposed construction is inconsistent and improper. *Phillips*, 415 F.3d at 1314.

The Court should also reject Soter’s proposed constructions of “air quality” and “air quality sensor” because they are inconsistent with Soter’s proposed construction of “abnormality

matching signature of vaping,” which uses the term “parameters” in relation to “threshold values or ranges” received from an air quality sensor. *See infra* Section III.B; Brown Dec. ¶25. Soter cannot support such two inconsistent constructions simultaneously—either “parameters” represents a value/quantity of the content/condition of the air (as IPVideo contends) or “parameters” means a range of values/quantities or set of values/quantities above some threshold that when detected indicate the presence of vaping (as Soter contends), but not both. *Id.*

Lastly, Soter’s proposed construction of “air quality” and “air quality sensor” are inconsistent. *See* Brown Dec. ¶26. Soter would have the Court construe “air quality sensor” to mean “a sensor capable of sensing or detecting one or more parameters of *air quality* that is present at a site.” Substituting Soter’s proposed construction for “air quality” into its proposed construction for “air quality sensor” results in the following nonsensical construction: “a sensor capable of sensing or detecting one or more parameters of *one or more parameters relating to the content or condition of the air that is present at a site* that is present at a site.” The inconsistencies between Soter’s proposed constructions for “air quality” and “air quality sensors” require that the Court reject both proposed constructions.

E. “Abnormality Matching Signature Includes . . .” (claims 2, 14); or “Signature Includes . . .” (claim 26).

Soter’s Construction	IPVideo’s Construction
“the parameters indicating the presence of vaping includes a temperature range, a hydrogen range, and a humidity range”	“detectable properties or contents of air indicating the presence of vaping that include a temperature range, a hydrogen range, and humidity range”

To narrow the issues before the Court, IPVideo has adopted Soter’s proposed construction, in part. As modified, the only dispute remaining relates to Soter’s improper use of the term “parameter,” which it imports here from its proposed constructions for “air quality” and “air quality sensor” discussed above *See infra* at Sec. III.D. For those reasons, Soter’s use of “parameter” is improper, and should be rejected in favor of “properties or contents of air.” *Id.*

Soter's attempt to demand different definitions for "a signature" and "the signature includes" is likewise misguided and should be rejected. *See supra* Section III.C.

F. "Identifying Vaping" & "Vaping Is Identified" (claims 1, 13, 25).

Soter's Construction	IPVideo's Construction
"determining that vaping is present at a site based on one or more measured parameters from an air quality sensor indicating the presence of vaping"	"recognize/recognizing the detected temperature, hydrogen, and humidity values that taken together indicate the presence of vaping"

Soter's proposed constructions are improper for the reasons discussed above regarding the terms "abnormality matching signature of vaping" and "air quality." *See supra* Secs. III.B (explaining why "abnormality matching signature of vaping" must include "temperature, hydrogen, and humidity values") & III.D (explaining why "parameter" is improper).

G. "Sound Detector" & "Detected Sounds" (claim 6).

Soter's Construction	IPVideo's Construction
"a sensor that detects sound levels in the environment"	plain and ordinary meaning; Alternatively, "an electronic sensor capable of detecting sounds"
"sound levels measured by a sound detector"	plain and ordinary meaning Alternatively: "sounds detected by the sound detector"

The terms "sound detector" and "detected sounds" need not be construed because POSA, and indeed the Court and jury, would understand the terms from their plain and ordinary meaning. *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1369 (Fed. Cir. 2012) ("Absent disclaimer or lexicography, the plain meaning of the claim controls."). Both terms are well-known and comprise words commonly used in "common parlance" that have "no special meaning in the art." *Summit 6*, 802 F.3d at 1291; *see also* col. 8:59-64 (explaining the obvious: that "sound sensor 210 detects sound levels"); col. 10:36-27 ("the sound sensor detects sounds").

Soter's proposed constructions should also be rejected because they add ambiguity to otherwise straight-forward terms and are inconsistent with intrinsic evidence because there is no indication of what "the environment" would be. *See Brown Dec.* ¶64.

Therefore, IPVideo respectfully requests adoption of its proposed claim constructions.

Dated: April 8, 2021

Respectfully submitted:

/Richard T. Matthews/
Richard T. Matthews
Andrew R. Shores
WILLIAMS MULLEN, P.C.
P.O. Drawer 1000
Raleigh, NC 27602-1000
Telephone: (919) 981-4000
Fax: (919) 981-4300
rmatthews@williamsmullen.com
ashores@williamsmullen.com

Janet M. Smith
WILLIAMS MULLEN, P.C.
200 South 10th Street, Suite 1600
Richmond, VA 23219
Telephone: (804) 420-6212
Fax: (804) 420-6507
jmsmith@williamsmullen.com

Robert M. Isackson
Lauren Brette Sabol
Martin Bernard Schwimmer
Leason Ellis LLP
One Barker Avenue, 5th floor
White Plains, NY 10601
Tel.: (914) 288-0022
Fax: (914) 288-0023
isackson@leasonellis.com
sabol@leasonellis.com
schwimmer@leasonellis.com

Counsel for Defendants

CERTIFICATE OF SERVICE

I hereby certify that on April 8, 2021 the foregoing document was electronically served by email, pursuant to an agreement between the Parties, on all counsel of record as identified below. Plaintiff will file a “bundled” version of the complete briefing with the Court upon the close of briefing, in accordance with the Individual Practice Rules of Judge Gary R. Brown, effective October 23, 2020.

Wendy R. Stein
GIBBONS P.C.
1 Pennsylvania Plaza, 37th Floor
New York, NY 10119
Telephone: (212) 613-2000
wstein@gibbonslaw.com

Christopher H. Strate
Christine A. Gaddis
GIBBONS P.C.
One Gateway Center
Newark, NJ 07102
Telephone: (973) 596-4500
cstrate@gibbonslaw.com
cgaddis@gibbonslaw.com
Counsel for Plaintiff

Paul F. Millus, Esq.
Daniel B. Rinaldi, Esq.
990 Stewart Avenue
Garden City, New York 11530-9194
Telephone: (516) 741-6565
pmillus@msek.com
drinaldi@msek.com
Counsel for Intelligent Product Solutions, Inc.

/Andrew R. Shores/
Andrew R. Shores
WILLIAMS MULLEN, P.C.
P.O. Drawer 1000
Raleigh, NC 27602-1000
Telephone: (919) 981-4000
ashores@williamsmullen.com
Counsel for Defendants